Space Weather Forecast

Issued on Thursday, 01 February 2024 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated R1/R2 Radio Blackouts. Possible glance from coronal mass ejection and slight chance of peak G1/Minor Storm conditions early day 1 (01 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low, with a peak mid-level common-class flare. There are currently nine sunspot regions on the disc, two of which are noteworthy and four of which are yet to be numbered. A large spot in the northeast remains the most magnetically complex region on the disc, with continued growth. A smaller yet almost equally complex spot resides in the northeast also, this has grown recently and comprises a north-south magnetic alignment in it's leading portion. Other spots on the disc have generally shown some slow development, but remain fairly simple and stable at this time. One new spot has become evident in the northwest, though this is small and simple.

A single coronal mass ejection was observed leaving the western limb shortly after midday on 31 Jan. Although the source of which is still not certain, after computation, it appears to be missing behind Earth.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of a weak and waning coronal hole high speed stream. The solar wind fell from slightly elevated to slow-ambient levels. The interplanetary magnetic field was weak, with the north-south component, Bz, also varying weakly. The Phi angle was predominantly negative (towards the Sun). The net result of the above solar wind measures was Quiet geomagnetic activity (Kp 0-2).

Energetic Particles / Solar Radiation: High energy proton flux is at slightly elevated levels, but remains below the S1/Minor Storm threshold. There is a nominal risk of exceeding the S1 threshold during the period, with a slightly greater chance of this occurring on day 1 (31 Jan).

Four-Day Space Weather Forecast Summary

Solar Activity: Low, but with a chance of increasing to Moderate with isolated Moderate-class flares, most likely from the two largest regions in the northeast disc.

Solar Wind / Geomagnetic Activity: One coronal mass ejection features early in the forecast, though is now likely to have missed. There remains a small chance of a faint Earth glance from the flank early on 01 Feb. Solar winds are now slow-ambient after the previous coronal hole fast winds. The anticipated next high speed stream enhancement is expected to be on day 4 (04 Feb), with solar wind speeds reaching slightly elevated levels.

Generally Quiet to Unsettled conditions are expected through the period, with a chance of Active intervals and a slight chance of peak G1 Minor Storm intervals early day 1 (01 Feb), should any potential arrival occur from the 29 Jan coronal mass ejection. There is a chance for isolated Active intervals on day 4 (04 Feb), due to the influence of CH96/+.

Energetic Particles / Solar Radiation: High energy proton flux is expected to remain below the S1/Minor Radiation Storm level, with a nominal risk of exceeding the S1 threshold during the

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period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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